**4) HYPERBOLA**

The basic equations for a hyperbola are very similar to the equations for the ellipse, but there is a negative sign between the two left hand side terms.

The basic equations for a hyperbola are:

* Centre = (0, 0)
* x – intercepts:
* Asymptotes: ,

Quick sketch of asymptotes:

Point 1: centre

Point 2: (a, b)

Point 3: (a, -b)

Centre = (h, k)

Vertices are now and from centre (h, k), not the origin.

Asymptotes are now: ,

**COMPLETING THE SQUARE FOR A HYPERBOLA**

Examples:

1. Sketch .

Centre =

Asymptotes:

simplified: .

1. Sketch

Centre =

Asymptotes:

simplified: .

**HOW TO FORM AN EQUATION, GIVEN THE GRAPH OF A HYPERBOLA**

1) Start with the basic equation of a hyperbola: either or .

2) Pick a point on your hyperbola that is NOT either of the vertices.

3) Substitute the coordinates of that point, and the value of , into the equation for a

hyperbola, and solve for .

4) Write your final equation.

Worksheet

Delta Ex 37.4 pg 36.7 Q2 – 5, 7 (ignore foci).

Extension: Q6, 8, 9.